

FADING

CHARACTERISTICS OVERVIEW CHART

| Verbal Skills | Grade Levels | Cognitive Level | Areas Addressed |
|---|---|---|--|
| <input checked="" type="checkbox"/> Nonverbal | <input checked="" type="checkbox"/> PK | <input checked="" type="checkbox"/> Classic | <input checked="" type="checkbox"/> (Pre)Academic/Cognitive/Academic |
| <input checked="" type="checkbox"/> Mixed | <input checked="" type="checkbox"/> Elementary | <input checked="" type="checkbox"/> High | <input checked="" type="checkbox"/> Adaptive Behavior/Daily Living |
| <input checked="" type="checkbox"/> Verbal | <input checked="" type="checkbox"/> Middle/High | Functioning | <input checked="" type="checkbox"/> Behavior |
| | | | <input checked="" type="checkbox"/> Communication/Speech |
| | | | <input checked="" type="checkbox"/> Social/Emotional |

BRIEF INTRODUCTION

Children and youth with autism (AU) are often taught new skills through the use of prompts. However, it is important to systematically withdraw or fade these prompts so that the individual can perform skills independently (Alberto & Troutman, 2006).

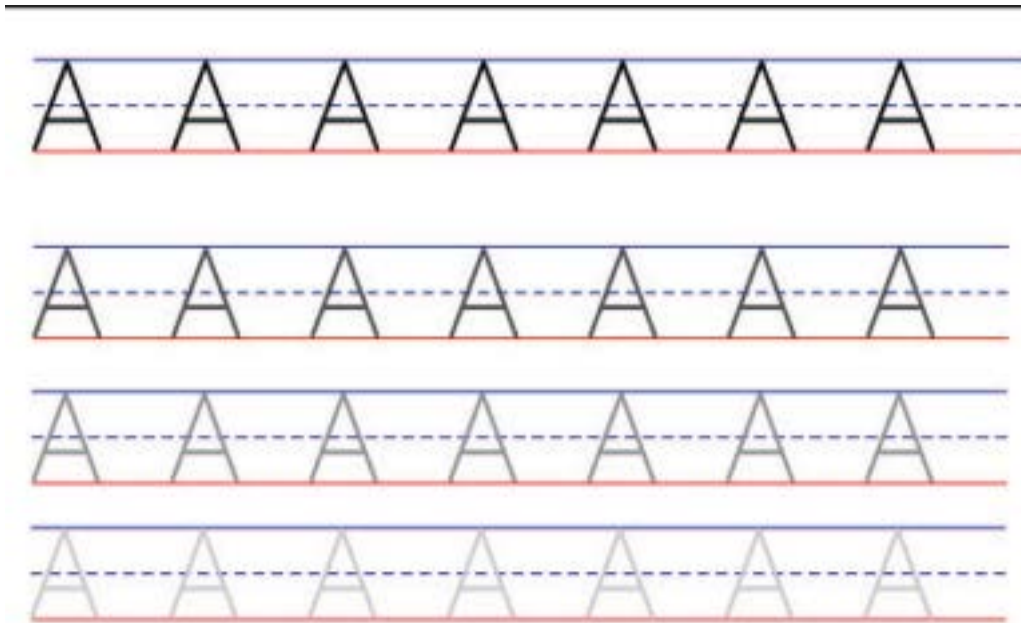
DESCRIPTION

Fading, an applied behavior analysis strategy (ABA), is most often paired with prompts, another ABA strategy. Fading refers to decreasing the level of assistance needed to complete a task or activity. When teaching a skill, the overall goal is for the student to eventually engage in the skill independently. For example, when a skill is taught using a hand-over-hand prompt, it should be withdrawn as soon as possible so the student can perform the task without prompts. Thus, as an individual gains mastery of a skill at a particular prompt level, the prompt is faded to a less intrusive prompt (i.e., from hand-over-hand to touching a hand). This ensures that the individual does not become overly dependent on a particular prompt when learning a new behavior or skill.

For example, fading the physical prompt of guiding a child's hands may follow this sequence: (a) supporting wrists, (b) touching hands lightly, (c) touching forearm or elbow, and (d) withdrawing physical contact altogether. Fading ensures that the child does not become overly dependent on a particular prompt when learning a new skill (Cooper, Heron, & Heward, 2007).

One of the first decisions that should be made when teaching a new behavior is how to fade the prompt or prompts. A plan should be in place to fade the prompts in an orderly fashion.

The following is an example of fading a visual prompt when teaching a student to write the letter A.



The sequence on page four shows one method of fading a gestural prompt. The target is to teach a student to recognize a picture of a fire truck. The arrow represents a gesture toward the object.

STEPS

The steps of fading include:

1. Identify the behavior to be taught and level of prompts needed for the student to complete the task.
2. Identify the process that will be used to fade the prompt or prompts.
3. Identify criteria that will indicate that the prompt or prompts can be faded (i.e., 80% accuracy over three days).
4. Put process into effect.
5. Take data.
6. Fade prompts as planned.

BRIEF EXAMPLE

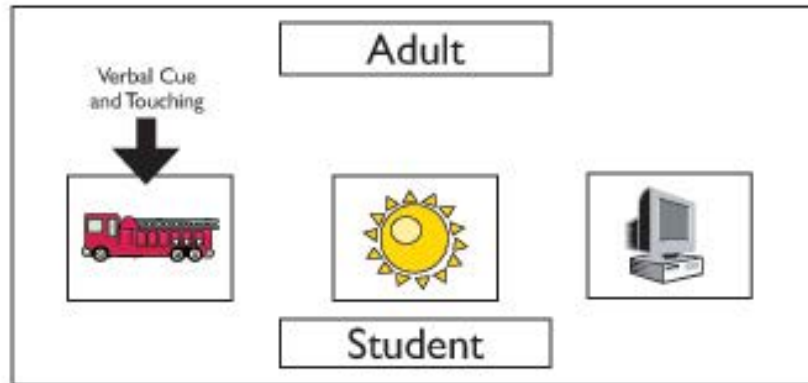
Mr. Taon wanted to teach 6-year-old Warna with classic autism to get ready to leave the classroom when the bell rang. He decided to use prompts and to fade them as Warna became independent. At first, Mr. Taon pointed to a visual of a bell and a door when the bell rang while gently prompting Warna to get up and move toward the door. This prompt involved Mr. Taon placing a hand under each of Warna's elbows. He would keep one hand on her elbow to guide her to the door while holding the visual.

Over the course of three weeks, he faded his prompt to (a) a light touch on one elbow while handing her the visual, (b) a light touch on her hand and a point to the visual, (c) a point toward a visual, and (d) finally he removed himself from Warna's desk area.

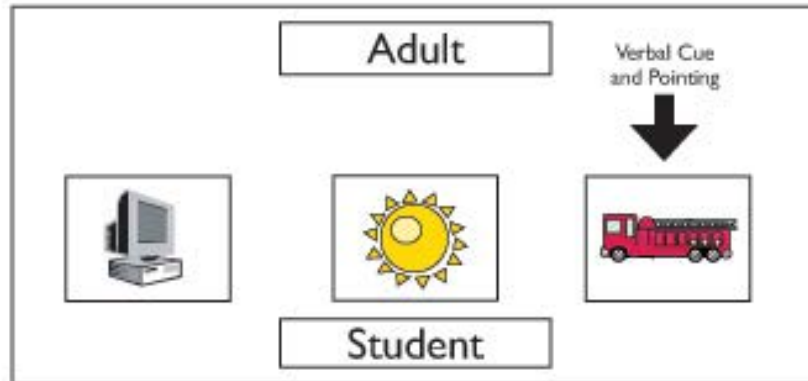
SUMMARY

Fading is the procedure of transferring stimuli as prompts to the natural stimulus. The goal is for students to produce correct responses and minimize errors when only the natural stimulus is provided.

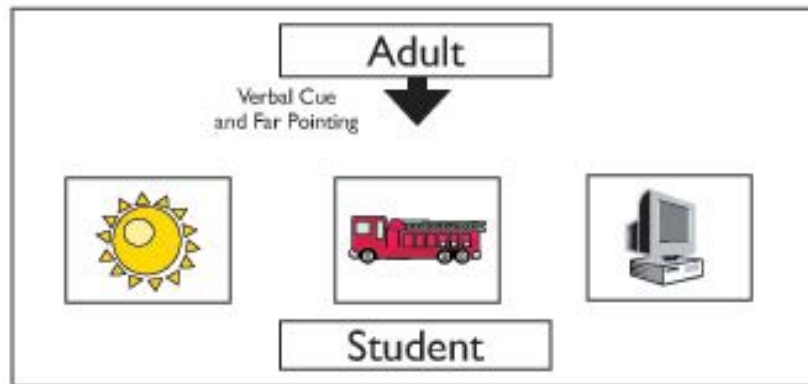
1.



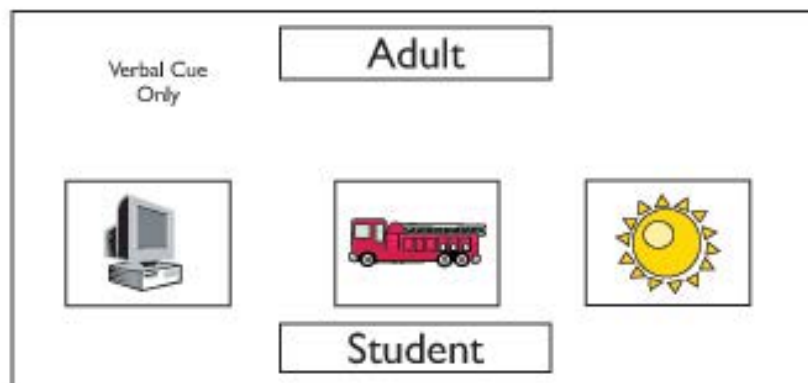
2.



3.



4.



RESEARCH TABLE

| Number of Studies | Ages (year) | Sample Size | Area(s) Addressed | Outcome |
|-------------------|-------------|-------------|--|---------|
| 17 | 2-15 | 67 | Aggressive behavior, problem behavior, liquid and food refusal behavior, self-management, sight-word reading skills, word identification, discrimination learning, conversational exchanges engagement, disruptive behavior, sleep problems, promoting school attendance | + |

STUDIES CITED IN RESEARCH TABLE

1. Thomas, B.R., Lafasakis, M., Sturmey, P. (2010). The effects of prompting, fading, and differential reinforcement on vocal mands in non-verbal preschool children with autism spectrum disorders. *Behavioral Interventions*, 25, 157-168.
This study reported the successful use of a behavioral intervention package involving prompting, fading of prompts, and differential reinforcement to teach requesting behaviors to three 3-yr old children with ASD. In a multiple-baseline-across-participants design, the authors found that requests were learned following the introduction of teaching and generalized to situations outside the teaching environment.
2. Birkan, B., McClannahan, L. E., & Krantz, P. J. (2007). Effects of superimposition and background fading on the sight-word reading of a boy with autism. *Research in Autism Spectrum Disorders*, 1, 117-125.
The study assessed the effects of stimulus super-imposition and background fading on the sight-word reading skills of a 6-year-old boy with autism. Results showed that after all steps had been faded, the student correctly read almost all of the 15 target words and these skills maintained on a 44-day follow-up probe. In addition, generalization of skills was demonstrated.
3. Hetzroni, O. E., & Shalem, U. (2005). From logos to orthographic symbols: A multilevel fading computer program for teaching nonverbal children with autism. *Focus on Autism and Other Developmental Disabilities*, 20, 201-212.
The study investigated the use of a computer-based intervention for teaching orthographic symbols to children with AU. Six children with autism aged 10 to 13 were taught to identify words from commercial logos depicting food items through a structured seven-step fading procedure. Results indicated that after exposure to the fading procedure, all children were able to identify the orthographic symbols and maintain the knowledge over time. Most of the children were able to transfer their knowledge and generalize to daily activities within the classroom.

4. Luiselli, J. K., Ricciardi, J. N., & Gilligan, J. (2005). Liquid fading to establish milk consumption by a child with autism. *Behavioral Interventions*, 20, 155-163.
In this study, a 4-year-old girl with autism and food selectivity was taught to drink milk through a liquid fading procedure. The feeding protocol consisted of gradually increasing the concentration of milk in a beverage she consumed 100% of the time. Results showed that milk consumption was achieved rapidly without interruption to the fading sequence.
5. Pelios, L. V., MacDuff, G. S., & Axelrod, S. (2003). The effects of a treatment package in establishing independent academic work skills in children with autism. *Education & Treatment of Children*, 26, 1-21.
The study evaluated the effectiveness of a treatment package in producing independent work by three children with autism aged 5 to 9 with minimal supervision by an adult. The package included (a) delayed reinforcement for on-task and on-schedule responding, (b) fading of instructional prompts and of the instructor's presence, (c) unpredictable supervision, and (d) response cost for off-task responding. Results indicated increased levels of on-task and on-schedule responding during treatment for all three children with a supervising adult only occasionally present. Two children required minimal adult supervision in maintenance. Behaviors of all three children were also generalized.
6. Ringdahl, J. E., Kitsukawa, K., Andelman, M. S., Call, N., Winborn, L., Barretto, A., & Reed, G. K. (2002). Differential reinforcement with and without instructional fading. *Journal of Applied Behavior Analysis*, 35, 291-294.
An 8-year-old girl was evaluated using a differential-reinforcement-based treatment package designed to reduce problem behavior during instructional situations. Results indicated that differential reinforcement of alternative behavior with instructional fading resulted in less problem behavior than without instructional fading.
7. Barry, L. M., & Singer, G.H.S. (2001). A family in crisis: Replacing the aggressive behavior of a child with autism toward an infant sibling. *Journal of Positive Behavior Interventions*, 3, 28-38.
The study evaluated the use of clinician-implemented skill training of replacement behavior and clinician fading with self-management of replacement behavior as a means of managing the aggressive behavior of a 10-year-old child with AU toward his sibling. The results showed a decrease in the occurrence of aggressive behavior, an increase in the percentage of intervals in which replacement behaviors occurred, and an increase in the duration of sibling interactions.
8. Sarokoff, R. A., Taylor, B. A., & Poulson, C. L. (2001). Teaching children with autism to engage in conversational exchanges: Script fading with embedded textual stimuli. *Journal of Applied Behavior Analysis*, 34, 81-84.
This study investigated the effects of a script-fading procedure using embedded text to teach two 8-year-old children with autism to engage in conversation statements about the stimuli. The results indicated that the use of scripts along with stimuli containing embedded text was effective in teaching children with autism to engage in conversation statements about the

stimuli. Further, both participants' scripted statements generalized to novel stimuli and the participation of a novel peer in the snack or video game sessions.

9. Schreck, K. A. (2001). Behavioral treatments for sleep problems in autism: Empirically supported or just universally accepted? *Behavioral Interventions*, 16, 265-278.
The study investigated the effectiveness of ABA for treating sleep problems in children with autism by conducting a computer search of all relevant literature. Six articles were found, collectively comprising 27 children with autism aged 2-12. The articles revealed four basic themes of behavioral techniques for treating sleep disorders among children with autism: bedtime routines, extinction, stimulus fading, and faded bedtimes. Results showed that of the ABA methods, only extinction provided sufficient evidence for a possibly efficacious intervention for sleep problems in children with autism.
10. Luiselli, J. K. (2000). Case demonstration of a fading procedure to promote school attendance of a child with Asperger's disorder. *Journal of Positive Behavior Interventions*, 2, 47-52.
This study provided a nonexperimental case demonstration of an intervention plan developed to promote the school attendance of a 5-year-old girl with Asperger Syndrome. The intervention began with the girl's mother being present continuously in the classroom. The mother was then scheduled to be out of the classroom for progressively longer durations of time introduced along a "fading" sequence. Positive outcomes were documented and maintained during a post-intervention period.
11. Freeman, K. A., & Piazza, C. C. (1998). Combining stimulus fading, reinforcement, and extinction to treat food refusal. *Journal of Applied Behavior Analysis*, 31, 691-694.
The study combined fading, reinforcement, and escape extinction using guided compliance to increase food consumption while maintaining low rates of disruptive behavior at mealtime for a 6-year-old girl with autism. Results indicated that intake increased and compliance with prompting procedures remained relatively stable despite the requirement that food consumption increase.
12. Hagopian, L., Farrell, D. A., & Amari, A. (1996). Treating total liquid refusal with backward chaining and fading. *Journal of Applied Behavior Analysis*, 29, 573-575.
The study reported on a 12-year-old boy with autism, mental retardation, and a history of severe gastrointestinal problems who presented with total liquid and food refusal. Backward chaining was used to shape drinking from a cup, and a fading procedure was used to increase the quantity of water he was required to drink. The study illustrated how a chain of responses that is totally absent can be shaped by first targeting a simple preexisting response in the chain.
13. Piazza, C. C., Moes, D. R., & Fisher, W. W. (1996). Differential reinforcement of alternative behavior and demand fading in the treatment of escape-maintained destructive behavior. *Journal of Applied Behavior Analysis*, 29, 569-572.
The study showed how the escape-maintained destructive behavior of an 11-year-old boy with autism was reduced during instructional sequences with differential reinforcement of compliance, escape extinction without physical guidance, and demand fading. The procedure decreased destructive behaviors to near-zero levels and greatly increased compliance.

14. MacArthur, J., Ballard, K. D., & Artinian, M. (1985). Teaching independent eating to a developmentally handicapped child showing chronic food refusal and disruption at mealtimes. *Australia & New Zealand Journal of Developmental Disabilities*, 12, 203-210.
The study describes an intervention to establish independent eating behaviors in a 3-year-old boy with autistic-like behaviors. The first phase of the intervention, using backward chaining with prompting and fading of prompts, reduced screaming, food refusal, and related disruptive mealtime behaviors and established appropriate eating responses. The second phase of the intervention successfully taught the mother to implement the teaching strategies and established independent mealtime behaviors at home. In addition, follow-up showed maintenance of independent eating.
15. Schreibman, L., & Charlop, M. H. (1981). S+ versus S- fading in prompting procedures with autistic children. *Journal of Experimental Child Psychology*, 31, 508-520.
The study investigated the relative effectiveness of two prompt-fading procedures for teaching difficult visual discriminations to eight children with autism. Both prompt procedures involved within-stimulus fading where manipulation occurred on the relevant component of the discrimination. One procedure presented fading first along the positive stimulus (S+), while holding the negative stimulus (S-) constant. The other procedure involved fading first along the S-, while holding the S+ constant. Results indicated that for all but one child, the discriminations were acquired significantly faster with fewer errors when the positive stimulus was faded first.
16. Luiselli, J. K., & Donellon, S. (1980). Use of a visual stimulus fading procedure to teach color naming to an autistic child. *Journal of Behavior Therapy and Experimental Psychiatry*, 11, 73-76.
The study investigated the use of a visual stimulus fading procedure to teach color naming to an 8-year-old boy with autism. The participant was taught to sight read the name of each of five colors that were superimposed over a card of the respective color. In a series of graduated steps, the color word was faded out until independent naming was achieved. During posttest assessments, correct responding was maintained and generalization of color naming was observed.
17. Rincover, A. (1978). Variables affecting stimulus fading and discriminative responding in psychotic children. *Journal of Abnormal Psychology*, 87, 541-553.
Two experiments were documented in this study. The first investigated stimulus variables in prompt fading that might reduce the attentional requirements for discrimination learning of eight children with autism aged 7 to 15 years. Two variables, distinctive vs. nondistinctive feature fading, were assessed, and significant main effects were found for both variables. The second experiment was conducted with the same children to assess whether they were still responding only to the pretrained feature after fading. Discriminative responding was maintained when the pretrained feature was made irrelevant, showing that the children attended to multiple features of a positive stimulus, but it was disrupted when the whole letter containing the pretrained feature was made irrelevant, showing that children still learned a restricted portion of the positive reinforcement.

REFERENCES

- Alberto, P. A., & Troutman, A. C. (2006). *Applied behavior analysis for teachers* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Barry, L. M., & Singer, G. H. S. (2001). A family in crisis: Replacing the aggressive behavior of a child with autism toward an infant sibling. *Journal of Positive Behavior Interventions*, 3, 28-38.
- Birkan, B., McClannahan, L. E., & Krantz, P. J. (2007). Effects of superimposition and background fading on the sight-word reading of a boy with autism. *Research in Autism Spectrum Disorders*, 1, 117-125.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- Freeman, K. A., & Piazza, C. C. (1998). Combining stimulus fading, reinforcement, and extinction to treat food refusal. *Journal of Applied Behavior Analysis*, 31, 691-694.
- Hagopian, L., Farrell, D. A., & Amari, A. (1996). Treating total liquid refusal with backward chaining and fading. *Journal of Applied Behavior Analysis*, 29, 573-575.
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RESOURCES AND MATERIALS

- Integrating ABA and Speech Pathology: <http://www.asatonline.org/helpdesk/clinician/speechpath.htm>
This links the user to several pages of resources concerning fading.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.
This book discusses fading procedures as well as other ABA strategies.

GENERAL RESOURCES

- Autism Internet Modules (AIM) www.autisminternetmodules.org. The Autism Internet Modules were developed with one aim in mind: to make comprehensive, up-to-date, and usable information on autism accessible and applicable to educators, other professionals, and families who support individuals with autism spectrum disorders (ASD). Written by experts from across the U.S., all online modules are free, and are designed to promote understanding of, respect for, and equality of persons with ASD.

- The Autism Web Course: http://cdd.unm.edu/swan/autism_course/about/index.htm. This web course was developed out of materials from the Interactive Collaborative Autism Network (ICAN). The Autism Programs at the University of New Mexico has updated and added information to this web course.
 - Characteristics
 - Assessment
 - Academic Interventions
 - Behavioral Interventions
 - Communication Interventions
 - Environmental Interventions
 - Social Interventions
 - Family Support Suggestions
- Indiana Resource Center for Autism (IRCA) <http://www.iidc.indiana.edu/irca/fmain1.html>. The Indiana Resource Center for Autism staff's efforts are focused on providing communities, organizations, agencies, and families with the knowledge and skills to support children and adults in typical early intervention, school, community, work, and home settings.
 - IRCA Articles: <http://www.iidc.indiana.edu/index.php?pageId=273>
- Texas Statewide Leadership for Autism www.txautism.net. The Texas Statewide Leadership for Autism in conjunction with the network of Texas Education Service center with a grant from the Texas Education Agency has developed a series of free online courses in autism. Please check the training page, www.txautism.net/training.html, for update lists of courses, course numbers and registration information. Current courses include the following:
 - Asperger Syndrome 101
 - Augmentative and Alternative Communication and the Autism Spectrum
 - Autism for the General Education Teacher
 - Autism 101: Top Ten Pieces to the Puzzle
 - Classroom Organization: The Power of Structure for Individuals with ASD
 - Communication: The Power of Communication for Individuals with ASD
 - Futures Planning for Students with Autism Spectrum Disorder
 - Navigating the Social Maze: Supports and Interventions for Individuals with ASD
 - Solving the Behavior Puzzle: Making Connections for Individuals with ASD